Dual high slew rate operational amplifier

BA4560/BA4560F/BA4560N

The BA4560, BA4560F, and BA4560N are dual operational amplifiers which achieve approximately twice the high output current of the BA4558, as well as featuring a higher slew rate of 4V/ μs, a gain band width of 10MHz, and an improved frequency characteristic. The following packages are available : 8-pin DIP (BA4560), 8-pin SOP (BA4560F), and 8-pin SIP (BA4560N).

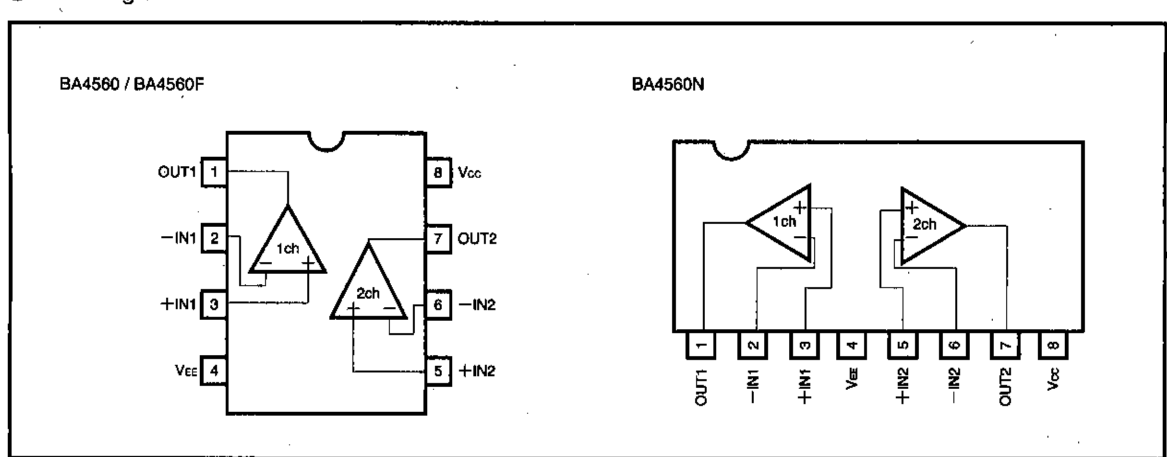
●Applications

Active filters
Audio amplifiers
VCOs
Other electronic circuits

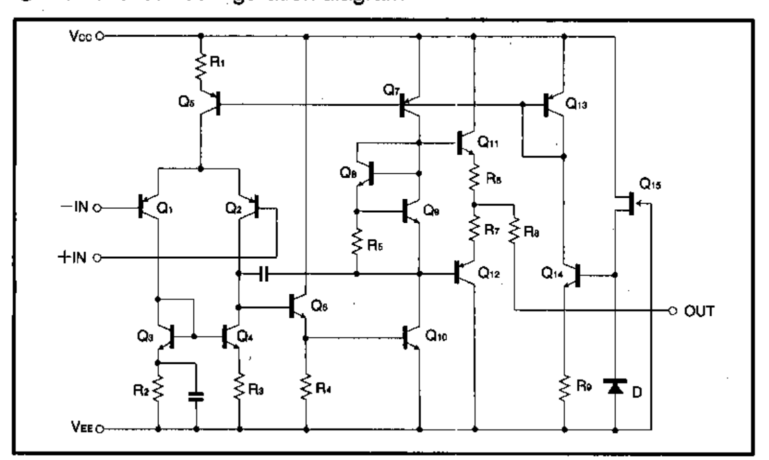
●Features

1) Built-in output short-circuit protection circuit.
2) Internal phase correction.
3) No latch-up.
4) Wide range of common mode and differential voltage.
5) High gain and low noise.

●Block diagram



● Internal circuit configuration diagram



● Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits			Unit
		BA4560	BA4560F	BA4560N	
Power supply voltage	Vcc	±18	±18	±18	V
Power dissipation	Pd	600*	550*	900*	mW
Differential input voltage	VID	±Vcc			V
In-phase input voltage	VI	−Vcc~Vcc			V
Operating temperature	Topr	−40~85			℃
Storage temperature	Tstg	−55~125			℃

* For Pd values, please see Pd characteristic diagram. Values are those when BA4560F is mounted on a glass epoxy PCB (50 mm x 50 mm x 1.6 mm).

● Electrical characteristics (unless otherwise noted, Ta=25℃, Vcc=+15V, VEE=-15V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input offset voltage	VIO	−	0.5	6.0	mV	Rs≦10kΩ
Input offset current	IIO	−	5	200	nA	−
Input bias current	IB	−	50	500	nA	−
High-amplitude voltage gain	Av	86	100	−	dB	RL≧2kΩ, Vo=±10V
Common mode input voltage range	VICM	±12	±14	−	V	−
Quiescent circuit current	IQ	−	4	7.5	mA	RL=∞ All Op - Amps
Maximum output voltage	VOM	±12	±14	−	V	RL≧10kΩ
Maximum output voltage	VOM	±10	±13	−	V	RL≧2kΩ
Common mode rejection ratio	CMRR	70	90	−	dB	Rs≦10kΩ
Power supply voltage rejection ratio	PSRR	−	30	150	μV / V	Rs≦10kΩ
Slew rate	S. R.	−	4.0	−	V/μS	Av=1, RL=2kΩ
Input noise voltage	Vn	−	−	2.2	μV	−
Voltage gain band width	GBW	−	10	−	MHz	f=10kHz
Maximum frequency	fT	−	2	−	MHz	−

●Electrical characteristic curves

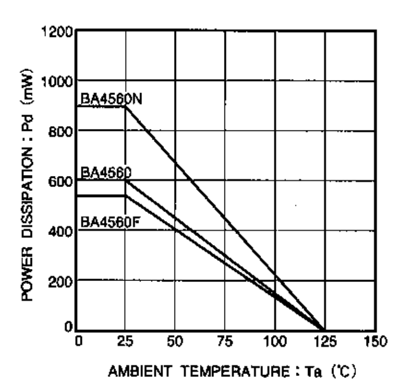


Fig.1 Power dissipation - ambient temperature characteristic

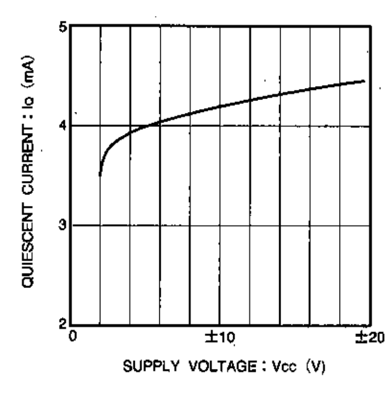


Fig.2 Quiescent current - power supply voltage characteristic

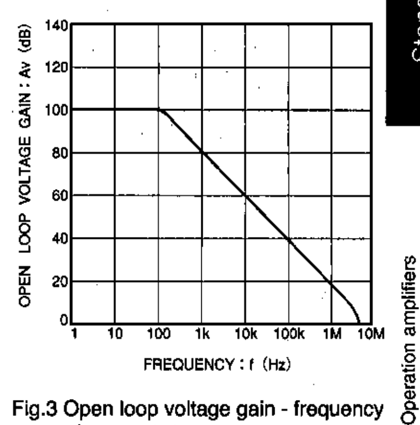


Fig.3 Open loop voltage gain - frequency characteristic

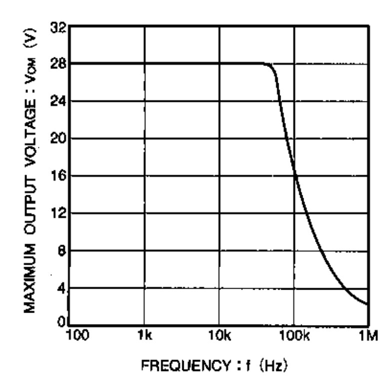


Fig.4 Maximum output voltage - frequency characteristic

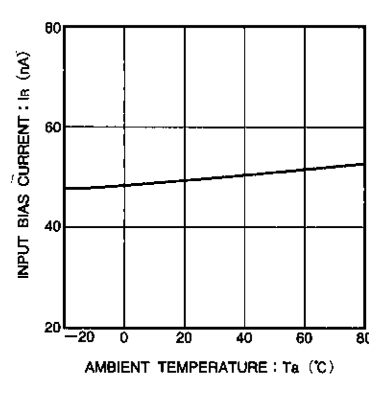


Fig.5 Input bias current - ambient temperature characteristic

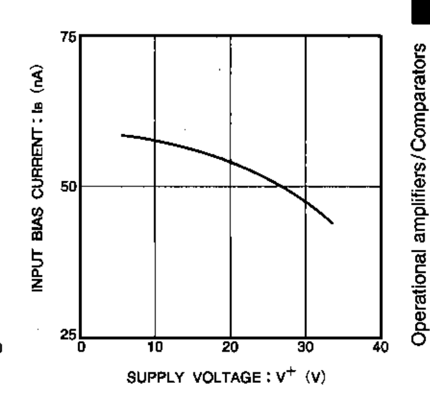


Fig.6 Input bias current - power supply voltage characteristic

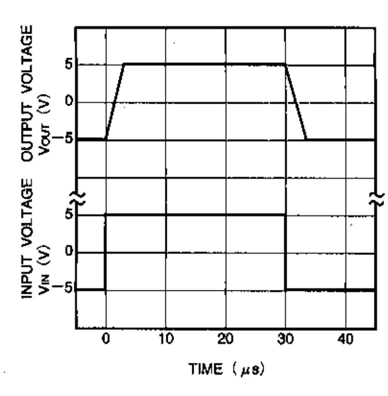


Fig.7 Output response characteristic

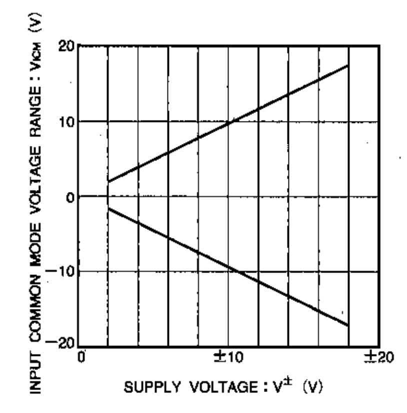


Fig.8 Common mode input voltage - power supply voltage characteristic

●Operation notes

Unused circuit connections

If there are any circuits which are not being used, we recommend making connections as shown in Figure 9, with the non-inverted input pin connected to the potential within the in-phase input voltage range (V_{ICM}).

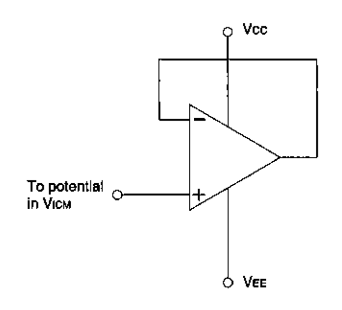


Fig.9 Unused circuit connections

●External dimensions (Units: mm)

